

We claim:

- 1 1. A fuel supply apparatus for supplying fuel to an internal combustion engine,
- 2 said fuel supply apparatus comprising
- 3 at least one fuel valve (16) for introducing the fuel into the internal
- 4 combustion engine;
- 5 a fuel tank (2);
- 6 a fuel line (10) connected to the fuel tank (2);
- 7 a first fuel pump (6) for supplying the fuel from the fuel tank (2) to the fuel
- 8 line (10);
- 9 a second fuel pump (12) for supplying the fuel from the fuel line (10) via a
- 10 pressurized line (14,42,44) to said at least one fuel valve (16) so that the fuel is
- 11 introduced into the internal combustion engine at least indirectly;
- 12 a fuel return line (22) connecting the fuel line (10) to the fuel tank (2) for
- 13 fuel return;
- 14 a pressure regulator valve (26) arranged in the fuel return line (22);
- 15 a shut off valve (30) arranged in the fuel return line (22) hydraulically in
- 16 series with the pressure regulator valve (26); and
- 17 a fuel scavenger line (60) conducts the fuel back to the fuel tank (2)
- 18 partially through the second fuel pump (12) and partially through a hydraulic
- 19 resistance means (61, 62, 66, 70, 72, 76, 84).

- 1 2. The fuel supply apparatus as defined in claim 1, further comprising means (20,

2 65) for controlling the shut off valve (30) according to a temperature.

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1 3. The fuel supply apparatus as defined in claim 1, wherein the second fuel pump
2 (12) has a pump housing (12g) and the fuel scavenger line (6) extends through
3 said pump housing (12g).

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1 4. The fuel supply apparatus as defined in claim 1, wherein the hydraulic
2 resistance means comprises another valve (61, 62, 66, 72) that opens depending
3 on a pressure.

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1 5. The fuel supply apparatus as defined in claim 1, wherein the hydraulic
2 resistance means comprises an additional valve (70, 76, 84) and said additional
3 valve has a flow-through resistance depending on the fluid flowing therethrough.

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1 6. The fuel supply apparatus as defined in claim 1, wherein the fuel scavenger
2 line (60) opens into the fuel return line (22) hydraulically between the shut off
3 valve (30) and the pressure regulator valve (26).

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1 7. The fuel supply apparatus as defined in claim 1, further comprising an
2 overpressure valve (7) connected in parallel hydraulically to the pressure
3 regulator valve (26).

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1 8. The fuel supply apparatus as defined in claim 1, further comprising a circulator

2 line (52,52') connecting the pressurized line (14, 42, 44) to the fuel line (10) via a
3 control valve (50,50').

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1 9. The fuel supply apparatus as defined in claim 8, wherein the circulator
2 line(52,52') is connected to the fuel line (10) by means of a hydraulic resistance
3 element (53,74,80).

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1 10. The fuel supply apparatus as defined in claim 8, wherein the circulator line
2 (52,52') is connected to the fuel line (10) by means of a check valve (53,80).

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1 11. The fuel supply apparatus as defined in claim 10, further comprising a throttle
2 (74) connected in parallel hydraulically to the check valve.

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1 12. The fuel supply apparatus as defined in claim 3, wherein the second fuel
2 pump (12) has a low pressure side (12n) and the fuel scavenger line (60) is
3 connected at a highest position thereof to said low pressure side (12n) of the fuel
4 scavenger line (60) and branches from the pump housing (12g).

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1 13. The fuel supply apparatus as defined in claim 8, wherein the second fuel
2 pump (12) has a compression chamber (12k) and the circulator line (52') extends
3 from the compression chamber (12k).

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1 14. The fuel supply apparatus as defined in claim 1, further comprising a leakage

2 line (88) connecting the second fuel pump (12) to the fuel tank (2).

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1 15. The fuel supply apparatus as defined in claim 14, wherein the leakage line

2 (88) opens into the return line (22) upstream of the shut off valve (30).